

## CLAIMS

What is claimed is:

- 1 1. A subscriber loop interface circuit apparatus comprising:  
2 a signal processor having sense inputs for a sensed tip signal and a  
3 sensed ring signal of a subscriber loop, wherein the signal processor generates  
4 a linefeed driver control signal in response to the sensed signals, wherein the  
5 signal processor resides on an integrated circuit die.
- 1 2. The apparatus of claim 1 wherein the sensed tip signal includes first  
2 and second sensed tip voltages, wherein a difference between the first and  
3 second sensed tip voltages is proportional to a tip current, wherein the sensed  
4 ring signal includes first and second sensed ring voltages, wherein a  
5 difference between the first and second sensed ring voltages is proportional to  
6 a ring current.
- 1 3. The apparatus of claim 1 wherein the signal processor is a  
2 complementary metal oxide semiconductor (CMOS) integrated circuit.
- 1 4. The apparatus of claim 1 wherein the signal processor calculates  
2 common mode and differential mode components of the subscriber loop.
- 1 5. An apparatus comprising:  
2 a signal processor generating subscriber loop control signals in response  
3 to a sensed tip signal and a sensed ring signal of a subscriber loop; and

4 a linefeed driver portion for driving the subscriber loop in accordance  
5 with the subscriber loop control signals, the linefeed driver portion providing  
6 the sensed tip and ring signals, wherein each of the linefeed driver portion  
7 and the signal processor resides on an integrated circuit die.

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1 6. The apparatus of claim 5 wherein the signal processor and the linefeed  
2 driver portion reside on a same integrated circuit die.

1 7. The apparatus of claim 5 wherein the signal processor and the linefeed  
2 driver portion reside on separate integrated circuit die in separate integrated  
3 circuit packages.

1 8. The apparatus of claim 5 wherein the signal processor and the linefeed  
2 driver portion reside on separate integrated circuit die within a same  
3 integrated circuit package.

1 9. The apparatus of claim 5 wherein the integrated circuit die is a  
2 complementary metal oxide semiconductor (CMOS) integrated circuit.

1 10. The apparatus of claim 5 wherein the signal processor computes  
2 common mode and differential mode components of the subscriber loop.

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11. The apparatus of claim 5 wherein the linefeed driver portion  
comprises:  
power circuitry providing battery feed to a ring node and a tip node of  
the subscriber loop in accordance with the subscriber loop control signals; and  
sense circuitry providing the sensed tip and ring signals, wherein the  
sensed tip and ring signals correspond to a tip current and a ring current of  
the subscriber loop.

12. The apparatus of claim 11 wherein the sense circuitry comprises:  
a tip resistor series-coupled to the tip node and the power circuitry;  
a pair of tip sampling resistors one end of each tip sampling resistor  
connected to opposite ends of the tip resistor, the other end of each tip  
sampling resistor forming a tip sense node;  
a ring resistor series-coupled to the ring node and the power circuitry;  
a pair of ring sampling resistors one end of each ring sampling resistor  
connected to opposite ends of the ring resistor, the other end of each ring  
sampling resistor forming a ring sense node.

13. The apparatus of claim 11 wherein the sensed tip signal comprises first  
and second sensed tip voltages, wherein a difference between the first and  
second sensed tip voltages is proportional to the tip current, wherein the  
sensed ring signal includes first and second sensed ring voltages, wherein a  
difference between the first and second sensed ring voltages is proportional to  
the ring current.

1 14. The apparatus of claim 11 wherein the power circuitry comprises:  
2 a tip control circuit, wherein the tip control circuit increases a tip node  
3 voltage in response to a first tip control signal, wherein the tip control circuit  
4 decreases a tip node voltage in response to a second tip control signal; and  
5 a ring control circuit wherein the ring control circuit increases a ring  
6 node voltage in response to a first ring control signal, wherein the ring  
7 control circuit decreases a ring node voltage in response to a second ring  
8 control signal.

1 15. A subscriber loop interface circuit apparatus comprising:  
2 a signal processor having sense inputs for a sensed tip signal and a  
3 sensed ring signal of a subscriber loop, wherein the signal processor computes  
4 common mode and differential mode components of the subscriber loop.

1 16. The apparatus of claim 15 further comprising:  
2 a linefeed driver portion for driving the subscriber loop in accordance  
3 with subscriber loop control signals provided by the signal processor, the  
4 linefeed driver portion providing the sensed tip and ring signals.

1 17. The apparatus of claim 15 wherein each of the signal processor and the  
2 linefeed driver portion resides on an integrated circuit die.

1 18. The apparatus of claim 16 wherein the signal processor and the  
2 linefeed driver portion reside on separate integrated circuit die within a same  
3 integrated circuit package.

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1 19. The apparatus of claim 16 wherein the signal processor and the  
2 linefeed driver portion reside on a same integrated circuit die.

1 20. The apparatus of claim 16 wherein each of the signal processor and the  
2 linefeed driver portion resides on separate integrated circuit die in separate  
3 integrated circuit packages.

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